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ABSTRACT

Research on classroom teaching is discussed within the conceptual framework of the analysis of student classroom tasks. Three types of learning tasks are illustrated: understanding; memory; and routine problem-solving according to an algorithm. It is contended that most classroom research projects study teachers' and students' actions, rather than learning tasks; it is assumed that learning is taking place as a result of these actions. Furthermore, there is more emphasis on how much is learned than on what is learned. Two important questions concerning teaching models are discussed: what are the actual tasks posed for students and teachers in classrooms?, and why do these tasks exist? After discussions of classroom task goals, ambiguity and risk concerning task accomplishment, and the role of students and teachers, three conclusions are presented: (1) there is not a direct cause-and-effect relationship between specific teacher behavior and student achievement, rather, teacher behavior is shaped by interaction with students; (2) learning tasks directly shape achievement; and (3) learning tasks do not always take place in the classroom. (GDC)

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The Tasks of Teaching and Learning in Classrooms

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The present analysis begins with a deceptively simple question: What do we see when we look in classrooms? The most obvious and least ideological answer is that we see students and teachers doing things. We might also want to add that students and teachers do many things together: there is often a common focus for classroom events as well as interaction among participants. If asked to explain what is going on in classrooms, we usually rely on the concepts of learning and personal dispositions. Teachers and students are, or at least should be, going about the business of maximizing the learning of some socially important content. What teachers and students do in classrooms can thus be interpreted as contributing to or interferring with learning. If evidence surfaces that teachers are acting in ways that do not seem to enhance learning--if teachers praise wrong answers or spend less time with students who need the most help to learn--then we typically argue that there are deficiencies of skill or spirit among teachers. These deficiencies can be removed by, first, conducting research on teaching to discover what teachers can do to optimize learning and, second, designing teacher education programs to modify the dispositions of teachers in desired directions.

All of this seems straightforward and internally consistent. Yet anomalies appear regularly in descriptions of classroom events, in correlations between these events and long-term outcomes, and in studies of how teachers think about what they do. Could it be that our basic understanding of classroom phenomena is in fact deficient?

In this essay I will argue that the answer to the question of what we see when we look in classrooms is far from clear and that our failure to answer this question has had enormous consequences for research on teaching and for efforts to improve schooling. I will then attempt to outline a way of thinking about classrooms that, while certainly not complete, would seem to lead to a better understanding of events and outcomes in these environments. The approach is fundamentally situational and rests on the premise that interpreting thought and action in a particular setting requires knowledge of: (a) the events surrounding participants; (b) the likely configurations of events over time in that setting; and (c) the tasks individuals are attempting to accomplish (see Laboratory of Comparative Human Cognition, 1978; Schank and Abelson, 1977). In other words, people get instructions for behavior from immediate circumstances, their knowledge of where present circumstances might lead, and the tasks which structure relations between events and purposes. This situational approach does not imply environmental determinism. Environments instruct, but, as any teacher knows, not everyone listens. And, as any student knows, instructions are not always clear.

The discussion begins with an introduction of the concept of task and an analysis of student tasks in classrooms. The perspective then shifts to the teacher and to interpretations of the tasks teachers face in classrooms. Throughout the discussion an attempt is made to examine the contributions of the task model to an interpretation of teaching effectiveness research.

Learning Tasks

To account for academic learning from classroom teaching it is necessary to have a model that explains how subject matter is processed in classroom environments. Recent studies in cognitive psychology suggest that the tasks people are working on shape to a large degree the way information is selected and processed (see Dawes, 1975; Frase, 1975; Frederiksen, 1972; Laboratory of Comparative Human Cognition, 1978; Newell & Simon, 1972; Rothkopf, 1976). Tasks organize experience in settings and, in Jenkin's (1977) words, "changing the subject's task changes the kind of events that the subject experiences" (p. 425). The concept of task would seem to be a promising place to begin the construction of a model to explain classroom events and their influence on outcomes.

The Concept of Task

It is first necessary to clarify what is meant by a "task," especially since the terms "task" and "activity" are often used interchangeably in classroom research. For present purposes, a task is defined by two elements: (1) a goal and (2) a set of operations necessary to achieve the goal. In a window-washing task, for example, the goal is to produce clean windows. To achieve this goal it is necessary to assemble appropriate materials--a ladder, brush, soap, water, etc.--and perform certain operations with these materials. The goal (clean windows)

organizes and gives direction to actions, including both the selection of items in the environment and the operations performed with these items.

Learning tasks are of a special character. In learning tasks, the goal is to be able to display a capability that does not presently exist. Actions taken to achieve this goal represent, in turn, practice leading to the acquisition of this capability. If a person does not know how to clean windows, then the immediate task is to learn what materials and operations produce this result. Not all tasks are, of course, learning tasks. In many situations, tasks can be accomplished by calling up routines that have already been learned. For convenience these will be called "performance" tasks to distinguish them from learning tasks. In performance tasks, changes in behavior may occur because of additional practice, but the process is more one of fine-tuning rather than acquisition of substantially new responses.

Types of Learning Tasks

The range of possible academic tasks can be illustrated by the following three types. The first type will be called "understanding" tasks, following terminology used by Anderson (1972). In this type of learning task, the goal is to acquire the ability to generate answers by applying cognitive operations such as classification, inference, deduction, or analysis, to instances that have not been encountered previously. Understanding can also be displayed by being able to recognize or

produce transformed or paraphrased versions of information previously considered. To acquire this capability, students must spend time processing information primarily for comprehension and practicing the kinds of operations that will enable them to generate answers by filling gaps in information given (see Brown, 1975).

A second type of learning task will be called "memory." In memory tasks, the goal is to be able to reproduce information that has been encountered previously. The capability to be acquired, in other words, involves recall or recognition of facts, principles, or solutions the student has already seen. The ability to reproduce information is subject to proactive and retroactive interference, and this ability can be acquired by standard memory strategies such as frequent rehearsal, use of mnemonics, overlearning, etc. (see Anderson & Faust, 1975).

A final type of learning task considered here is the routine or algorithmic problem-solving task. In this task, students must learn a standard and reliable formula that can be applied to a restricted range of problems which produce predictable or "regular" answers (Davis & McKnight, 1976; Getzels, 1964). Many arithmetic problems, such as dividing with fractions or squaring numbers, are of this type. In this case, the formula generates answers and the students' task is to learn how to use the formula.

A basic premise of the task model is that students will learn the responses they make while learning (Markle, 1969).

That is, if a learning task is being accomplished, then students will acquire the operations they use to reach the goal of the task. What is learned does not necessarily depend on formal instruction. In accomplishing learning tasks students can learn operations not explicitly taught (Resnick, 1976) and sometimes devise solution strategies that produce correct answers but are highly eccentric and fundamentally erroneous (Erlwanger, 1975). Nevertheless, if a learning task is accomplished, there will be effects. And, the effects are likely to be task specific, that is, they will only appear on tasks with a similar character.

This emphasis on operations as the outcome of learning tasks suggests that the use of content labels to designate tasks can be misleading. It is quite possible to have different operations involved in accomplishing tasks with the same content. For example, knowing how to square a number (a routine task) is not equivalent to knowing when to square a number (an understanding task involving classification of solution strategies by problem types). Similarly, students can be learning about primary and secondary sources in American history, but in one situation they may be asked to reproduce classifications given in class (a memory task) and in another to classify a new set of materials not previously encountered (an understanding task). If different tasks are accomplished with the same content, the effects are likely to be qualitatively different and thus detectable only if evaluation tasks are sensitive to these differences.

Learning Tasks and Research on Teaching

To this point it would appear that I have done little more than explicate the underlying premise of most research on teaching (see Gage, 1978). Classrooms exist to instill dispositions to act in specified ways on later occasions when competence is required. What teachers and students do in classrooms either contributes to or interferes with acquisition of these dispositions. By studying classroom events and relating these events to measures of achievement it should be possible to discover what teachers can do to optimize learning. We should be able, in other words, to move from descriptions of teaching behavior to prescriptions for teaching practice as long as achievement is used as a criterion in the formula.

In actual practice, however, tasks are seldom studied at all. Rather, actions are described and the assumption is made that the goal of these actions is learning. Learning tasks, in other words, are assumed to be taking place. The diverting of attention from tasks to actions is understandable. When observing a class, goals are often difficult to discern and evidence concerning actual goals may not be available unless observations take place for a very long time or on certain special occasions. Actions, in contrast, are readily seen. Students write, answer questions, watch the teacher, etc. If learning is assumed to be the business at hand for students, it is natural to ask questions about the relationship between these actions and achievement. Do students who write more, answer more, or watch more also tend to learn more? And, if the goal is eventually to

make statements about what teachers can do to enhance learning, it is necessary to record teacher behaviors. Indeed, if enhancing learning is assumed to be the business at hand for the teacher and the teacher, as an adult and the primary social agent for schooling, is seen as the cause of what students do in class, then an observer will be inclined to watch the teacher primarily. (Anyway, recording student behavior is difficult.) Finally, if statistical generalizability is sought, then it is necessary to aggregate teacher data across classrooms, with the modest additional assumption that learning is the business at hand for all these teachers and that they are all working on the same learning tasks.

In the process of data gathering the observer has, of course, moved rather far from the task conditions under which the behavior actually occurred. On the surface, this does not seem to be too much of a problem. Classrooms are for learning and, if grade level and subject matter designations are reasonably similar, then the analysis should be on safe grounds. That is, it should still be possible to extract prescriptions for practice from significant relationships between descriptions of teacher behavior and achievement. Or, at least the investigator should be in a position to find reasonably good hypotheses about the relationship between teaching behavior and product outcomes.

But what if the assumptions that learning is the business at hand, that teachers cause student behavior, and that all teachers in the sample are working on the same task, are wrong?

What if causality is reciprocal, or teacher actions are being directed to matters other than the enhancement of individual learning, or the teachers were not all working on the same learning tasks? Since task data were not recorded, it is impossible to verify the original assumptions of the research. The important question, then, is: What are the consequences of violating the original assumptions about homogeneity of learning tasks and the primacy of teacher causality? Two of these consequences are discussed below.

Quantitative vs. qualitative variables. Ignoring tasks in research on teaching also ignores the qualitative dimensions of teaching and learning: investigators typically do not know what was learned. This is an important point because not knowing what was learned seriously limits the possibility of finding true effects when they exist and restricts the types of process-product correlations that can be found.

How can this be? The basic argument is as follows. First according to the learning task model, teaching effects will be observable only when the performances required for the evaluation task match the performances acquired in accomplishing the learning task. It does not follow, however, that no effects occurred when they do not appear on a particular test (see Rothkopf, 1965). If a learning task was accomplished, then there were effects. The problem is to find a measure that is sensitive to qualitative differences in learning (see Marton & Saljo, 1976; Mayer & Greeno, 1972; Tamir, 1975; Walker & Schaffarzick, 1974). Thus,

ignoring tasks in recording classroom data, measuring learning outcomes, and aggregating data across classrooms constrains the circumstances under which significant correlations between events and outcomes can occur. The actual effects of learning tasks will be detected only if the criterion measure happens to be congruent with task demands of instruction. If different learning tasks are pooled and a single criterion measure is used, then the effects of tasks that do not fit the measure will be masked.

Second, if qualitative differences in outcomes are ignored, then the only effects that can be found across classrooms will be quantitative. The investigator will be limited, that is, to differences in how much rather than what is learned. This focus on quantitative differences has consequences for the kinds of process-product correlations than can occur. If the only differences are quantitative, then it will be possible to find effects only for classroom measures based on a quantitative metric, such as curriculum pace or content covered.

Validity of process-product correlations. Several lines of research suggest that the assumptions about causality and learning which have guided teaching research are invalid. Studies of teacher thinking (Clark & Yinger, 1979) indicate that learning is not always the concern of teachers during either planning or interactive decision making. There is also consistent evidence that students play a significant role in shaping teacher behavior and that there is an association

between performance on achievement tests and performance in the classroom (Campbell, 1974; Copeland, 1978; Fiedler, 1975; Metz, 1978; Copeland, Note 1). In other words, students who score high on achievement tests appear to behave in classrooms in ways that reflect an orientation to academic tasks and this student behavior influences the way teachers conduct lessons.

These studies of causality have consequences for estimating the validity and generalizability of correlations between classroom events and learning outcomes. If enhancing learning does not define the teacher's task and if teachers do not necessarily cause their own behavior, then any associations between achievement and teaching behavior aggregated across tasks are likely to be spurious. The fact that many correlations between <u>teacher</u> variables and outcomes are unstable across studies and tend to wash out in experiments (Rosenshine, 1971, 1976) suggests that many findings from naturalistic research are spurious. Using a mediational paradigm which adds student variables such as attention and time on activity to the analysis of teacher effectiveness does not necessarily help. If the assumptions about tasks and causality do not hold, if students are not working on learning tasks or if high achieving students also attend longer to classroom events, then statements about teacher effects on student behavior or on outcomes, or even statements about the effects of student actions on outcomes, are not necessarily valid.

Recent Process-Product Studies

Results of recent process-product studies fit this conceptual formulation well. When grade level and academic content--probable indicators of task type--have been taken into account in analyzing data, as in the studies of reading and math in the elementary grades (Anderson, Evertson, & Brophy, 1979; Brophy & Evertson, 1976; Good & Grouws, 1977; Stallings, 1975; McDonald & Elias, Note 2) then process-product associations have been more robust and consistent. These findings have been especially clear for quantitative classroom measures such as pace and time spent on content (Good, Grouws, & Beckerman, 1978; Good & Beckerman, 1978). Positive results from the study of academic learning time, which by definition consists of time spent on content congruent with that covered on the criterion test (Fisher, Filby, Marliave, Cahen, Dishaw, Moore, & Berliner, Note 3), also reflect the value of focusing on learning tasks in studies of effectiveness. Finally, the direct instruction model (Rosenshine, 1976) can be interpreted, using Stodolsky's (1972) conception of "treatment" effects in classrooms, as suggesting that if there is task homogeneity at the class level--i.e., if students do not have a choice as to whether to engage in learning tasks or which learning tasks to accomplish--then effects will be more likely to occur and more uniform across students.

It would seem, then, that as teaching effectiveness investigators have moved closer to task variables and have actually met some of the assumptions about the nature and commonality of tasks across classes, productivity of studies has improved. The Texas Junior High School Study provides an interesting lesson in this regard (Evertson, Anderson, & Brophy, Note 4). In the math data, where task conditions appear to have been more uniform, the results are internally consistent and clear. In the English data, where the content label was probably less descriptive of learning tasks, the results are less consistent and less interpretable.

Teaching effectiveness research has not, however, found the Holy Grail. There are still problems with these results, problems flowing from the fact that little is known about what tasks were operating in the classrooms studied and what the students learned. Without this information about tasks, it is still possible that effects are being masked. Students may be learning very important operations with content, operations that are more reflective of the nature of the discipline and necessary for further learning (Davis, Jockusch, & McKnight, 1978; Greeno, 1976), but these effects are being masked by the achievement measures used or are not apparent because of an emphasis on the quantitative criterion of coverage. It is quite possible that ignoring qualitative dimensions of learning may restrict the range of possible learning outcomes that instructional policies based on effectiveness results can produce. In addition, methods that are quite effective on criteria

other than coverage are perhaps being overlooked. It would appear necessary to give more serious attention to the question of what effects we are committing ourselves to when we apply findings from teaching effectiveness research.

There is even a more serious problem with the recent data on effectiveness. Without task data, it is difficult to determine whether information about different learning tasks is being mixed. If this is so, then some of the results are likely to be spurious. This brings the analysis back to the questions of the assumptions of learning and causality that underlie the attempt to extract prescriptions from descriptions of practice and the confidence that can be placed in process-product findings that emerge from this type of analysis.

Causality in Research on Teaching

Some may argue that the spuriousness is really a false issue. Is it not possible to resolve problems of causality by simply using experiments? Unfortunately no, because direct experimental knowledge about teaching effects in classrooms is impossible to obtain. To establish causality experimentally, it is necessary to remove precisely those features of complexity, unpredictability, and history that define the natural classroom environment (Doyle, 1977). Hence the external validity of experimental findings is indeterminant. The best than can be achieved is experimental verification that certain cognitive processes hypothesized to mediate classroom effects are in fact within the capability of teachers and students and are elicited by task conditions similar to those that occur in classrooms.

What, then, is the alternative for establishing causality in research on teaching? It would appear that the validity and generalizability of process-product findings depends primarily on the adequacy of our understanding of classroom environments. And, if the present analysis is accurate, if tasks are the fundamental organizers of behavior in settings, then our understanding of classrooms must be based on a study of the tasks that actually operate in classroom settings. We must, in other words, build an interpretive model on answers to two fundamental questions: What are the actual tasks posed for students and teachers in classrooms? and Why do these tasks exist? It is to these questions that the discussion now turns.

The Task of Learning in Classrooms

Learning tasks do not exist in a "pure" state in nature. Rather, they operate within a social system and a schedule of work, conditions that affect what is learned and how that learning must be displayed (see McDermott, 1976; Mehan, Note 5). In addition, learning tasks are embedded in an accountability structure defined by Becker, Geer, and Hughes (1968) as an exchange of performance for grades. The term "grades" in the present context does not refer simply to marks on report cards. The reference is, rather, to the various forms of summative evaluation, or public recognition for appropriate performance, that occur in classrooms. Students are called upon to display knowledge and skills on different occasions: they take tests, complete

assignments, answer questions in discussion, and so forth. The adequacy of their performance during these events is labeled by the teacher and these labels are usually available to an audience or even to people who have not witnessed the performance at all. Classroom studies (e.g., Jackson, 1968; Kepler, Note 6) indicate that judgments about performance occur frequently in classrooms at all levels, although the formality of the conditions under which the exchange takes place probably increases with the ages of the students. These studies suggest that the performance-grade exchange is a prevailing reality in classrooms and is likely to have a significant impact on student information processing.

Goals for Classroom Learning Tasks

What are the consequences of this evaluative context? At one level, it would appear that the real goals for learning tasks in classrooms are defined by the requirements of the performance-grade exchange. Accomplishing learning tasks in a classroom depends, in other words, on how well a student has gained the ability to respond in an appropriate way on those occasions when the teacher is making judgments about subject-matter competence. This origin of goals for learning tasks in classrooms introduces interesting complications for interpreting classroom events and their effects on outcomes. The requirements to be a participant in a classroom event may not necessarily be congruent with the requirements of the learning task operating in that classroom. For example, to participate in a teacher-led discussion a student

may be required to infer conclusions from data or learn how to classify objects into categories. To pass the unit test, however, a student may be required to reproduce inferences or object-category classifications formulated by other students or by the teacher during the class discussion. In these cases, participation in the classroom event is not necessarily appropriate practice for achieving a favorable performance-grade exchange. If students know in advance, either from prior experience or teacher cues, that the test will require reproduction, then it is likely that they will use this knowledge to allocate attention and select an information-processing mode during the class session. Indeed, student engagement is likely to be qualitatively and even quantitatively influenced by the congruence between the requirements of participating in classroom events and the requirements of the performance-grade exchange. If this task-relevant information is not gathered during observation, it will be very difficult to interpret correlations between events and outcomes.

Once again, the task model would appear to have promise for understanding classrooms. But the assumption is still being made that learning is the task. A more refined analysis suggests that this may not always be the case. The fact that goals for learning tasks in classrooms have their origin in the performance-grade exchange means that the proximate task for students is to get grades. The real task in classrooms is not necessarily to learn but to be able to behave appropriately when competence is being judged. In addition, there are several avenues available to

students for maximizing goal accomplishment--that is, for maximizing the likelihood of a favorable performance-grade exchange--and not all of these avenues involve learning. To understand the implications of this perspective, it is necessary to examine the consequences of different types of learning tasks.

Ambiguity and Risk in Classroom Tasks

Learning tasks differ according to the probability and efficiency of task accomplishment. In classrooms, these differences are experienced as degrees of risk and ambiguity. Risk refers to the likelihood of not being able to meet task demands on a particular occasion, either because the demands are great or the student will be unable to acquire the competence necessary to display the required performance. Ambiguity results from gaps in information about the exact performance that will be required and how to product it. The concern here is not ambiguity resulting from a lack of teacher clarity. Some tasks are inherently ambiguous. For example, writing is a task that is often ambiguous because public criteria for "good" writing are difficult to define and, in McPherson's (1977) words, "there can be no absolute formula for producing it" (p. 187).

The consequences of learning tasks in classrooms can be illustrated by identifying four types using the dimension of ambiguity and risk (see Figure 1). The first type has been labeled "Understanding." In this task, students are required to learn a set of generative principles or operations which are then applied to unencountered or transformed instances in order

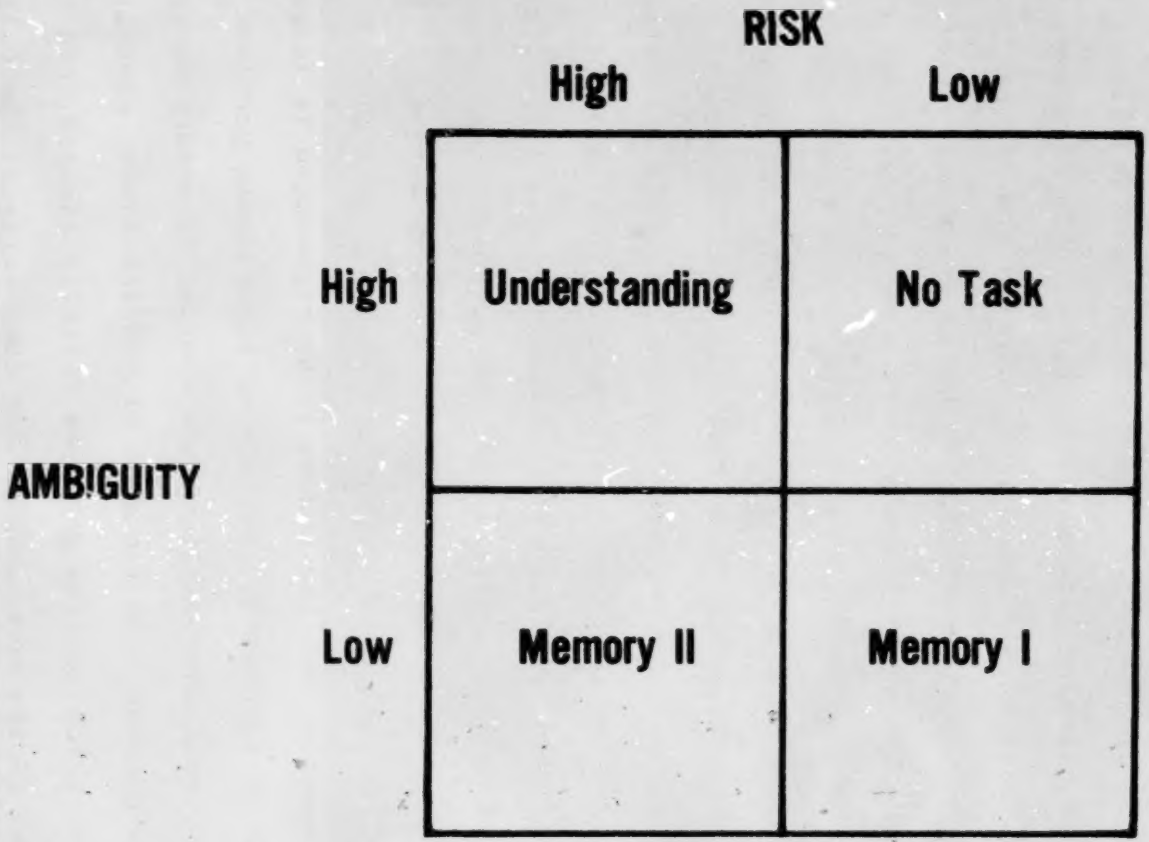

Fig. 1. Typology of academic task structures defined by the interaction of ambiguity and risk.

to derive answers (see Anderson, 1972). In other words, to measure understanding I must leave gaps in the information given to the student and thus the precise answer cannot be predicted by the student completely in advance. If it can be predicted in advance, then the task is recall rather than understanding. Thus ambiguity is necessarily present and likely to be high. Accomplishing understanding tasks would also seem to involve high risk, as defined here. Anderson and Biddle (1975) reported, for example, that mean scores on items which were written as paraphrases of the text were consistently lower than scores on items that were taken verbatim from the text. Thus, the likelihood of accomplishing a favorable exchange on understanding tasks is probably lower than for recall tasks.

There are two types of tasks defined primarily by memory, that is, the demand to reproduce information previously encountered during instruction. In "Memory I" tasks, there is low ambiguity--everyone knows what information they are supposed to memorize--and risk is low because the total amount to be memorized is not very large. In "Memory II" tasks, the emphasis is still on reproducing answers, but the amount to be reproduced is large and thus risk is increased. Routine or algorithmic problem-solving tasks, mentioned earlier, are similar to memory tasks in their consequences. In the case of routine tasks, ambiguity is low because the algorithm produces reliable answers, and the amount of risk varies according to the complexity of the calculations necessary to obtain answers.

A brief look at the relationships between tasks and outcomes suggests that the following connections are likely. For Understanding tasks, achievement would probably be limited to highly-skilled students. Memory I tasks, on the other hand, are well-formed problems which depend less on the ability and knowledge of the world the individual brings to the situation (Simon & Hayes, 1976). Thus, mean achievement is likely to be high with little variance. With Memory II tasks, entering ability is likely to interact with the amount to be learned to lower mean achievement and increase variance unless prompts are increased and time is allowed to vary for individuals (Bloom, 1976).

This configuration of task-outcome relationships suggests that many of the findings from recent teaching effectiveness studies that concentrate on quantitative measures of achievement are applicable primarily to Memory rather than Understanding tasks. There is some circumstantial evidence that this may indeed be the case. Good and Grouws (1977), for example, found that more learning was associated with greater coverage, clearer presentations, more product questions, and the provision of process feedback (i.e., the correct answer and information about how it was derived). Less learning was found in classrooms with less clarity, process questions (i.e., questions demanding inferences and explanations), less process feedback, and less coverage. Although direct empirical evidence would be preferable, these findings can legitimately be interpreted as suggesting that two different tasks are involved. The conditions associated with

more learning are consistent at least with those necessary for Memory tasks and the conditions associated with less learning are those typically necessary for Understanding tasks. Without task data for either classrooms or testing, however, it is impossible to verify this hypothesis.

The final type has been called "no task." In this situation, ambiguity is high but risk is low: students are not sure what they are supposed to do but it doesn't matter since any answer is acceptable. There is, in other words, no accountability for academic performance. This analysis suggests that eliminating grades--a proposal that has not infrequently been made--simply suspends the classroom task system. Learning tasks under such conditions may not necessarily be "meaningful." In addition, outcomes are likely to be random and process-outcome relationships uninterpretable.

Accomplishing Classroom Tasks

There would appear to be several avenues available to students for accomplishing classroom tasks (that is, achieving favorable performance-grade exchanges) in ways that reduce ambiguity and/or risk. Since ambiguity and risk are related to the type of learning task that operates in a classroom, these student strategies also affect the outcomes of classroom instruction. A brief discussion of three possibilities derived from recent classroom studies will illustrate this point.

Managing classroom exchanges. The risk involved in accomplishing classroom tasks can be reduced by managing the timing and content of recitations. Noble and Nolan (1976) found that individual students were able to determine when they had to participate in class discussions, and student stability data reported by Evertson and her colleagues (Evertson, Anderson, Edgar, Minter, & Brophy, Note 7) at the Texas Center indicates that there is some degree of consistency for students across classes, at least at the junior high school level, in the way in which they interact with teachers. This evidence suggests that students are able to have exchanges occur on their own terms, that is, when the likelihood of success is high. At the same time, students can avoid practicing skills which they do not have (see McDermott, 1976).

Even after a student has been called on to recite, there are ways to circumvent task demands. Mehan (1974) for example, reported instances in which first-grade pupils in a discussion used delays when answering to get others, including the teacher, to respond for them. Similar instances at the secondary level are reported by MacKay (1978). These students were able, in other words, to get someone else to do the work. A more detailed analysis of student strategies which circumvent task demands might explain the achievement differences noted between traditional and open classrooms (Bennett, 1976). In informal classrooms students typically work in small groups without direct teacher supervision. In such settings, it is more likely that students

can get other students to do the work for them. Thus data on how tasks are accomplished in classrooms are necessary to understand differences in outcomes across classroom formats.

A more common technique for managing risk would appear to consist of restricting output during exchanges to reduce the possibility of error. Of particular relevance in this regard are studies of language use in classrooms, most of which indicate that student performance on academic tasks is restrained. Searle (1975), for example, studied the spoken language of high school students in English, social studies, and physics classes and found qualitative differences between academic and non-academic episodes. In his words:

> The talk which resulted from their activities as participants in school work was usually a series of short exchanges /and/ was not in itself complete but required either reference to texts or movement. . . . It would seem that the students understood that there was one kind of talk to be used among themselves and another kind which was suitable for school work. (p. 280)

Similarly, Graves (1975), in a study of writing in the second grade, found that texts for assigned writing were shorter than those produced when what was being written was not assigned. Interestingly, this effect occurred regardless of whether the classroom organization was traditional and structured or open and informal, a finding that suggests that the conventional labels we use to distinguish educational "treatments" may lack utility.

Modifying task conditions. In addition to managing individual exchanges, students would also appear to direct their efforts at changing degrees of ambiguity and risk involved in the task structure itself. Davis and McKnight (1976) reported a case in which junior high school students strongly resisted an attempt by the teachers to modify the academic task structure of a mathematics course in a way that appeared to increase ambiguity and risk. The attempted modification consisted primarily of a shift in emphasis from a routine application of computational operations to a conceptualization of underlying mathematical principles, that is, from algorithmic problem-solving to understanding. Wilson (1976) described a similar instance in which students in an alternative high school resisted "inquiry" teaching. In both instances, students demanded greater explicitness concerning the precise nature of performance expectations. An alternative strategy, apparent in some of Cusick's (1973) classroom descriptions, involves attempts to increase the teacher's generosity in assigning grades, an approach that reduces risk.

In reducing ambiguity and risk, these student strategies would appear to change the nature of the learning task. As prompts increase, in the form of either supplementary information from the teacher or help from peers, the information-processing load for students is decreased and the task can be accomplished by such operations as copying or recall rather than understanding. Similarly, if risk is reduced enough, then a "no task" situation is created.

Routinizing classroom tasks. A final strategy for increasing the possibility of favorable performance-grade exchanges is to reduce the extent to which learning is necessary to accomplish classroom tasks. Learning, by its very nature, is a risky way to accomplish classroom tasks. It is much easier simply to rely on routines that have already been learned. Yinger (in press) found that teachers typically used routines (i.e., recurring patterns for activities) to reduce the complexity and unpredictability of classroom demands. It would seem that students also attempt to standardize and routinize classroom tasks to reduce the ambiguity and risk involved in exchanging performance for grades. To the extent that students are successful in getting teachers to repeat what are essentially the same tasks, then classroom tasks can be accomplished by using knowledge and skills already acquired rather than by learning. The strategy depends, of course, on the appearance of learning. Students must appear to be engaged in learning tasks. DeVoss (in press) reports an interesting case in which students often carried books when walking around the room or congregating for purposes that had more to do with social and personal agendas than academic learning.

In most classrooms, the routinizing of classroom tasks by students probably means that learning tasks are reduced to memory so that operations remain the same as content changes. Since memory is more reliable than understanding for accomplishing classroom tasks, this is a reasonable solution of task demands.

This analysis of learning tasks in classrooms clearly suggests that when we look in classrooms we may not be seeing learning at all. Moreover, since students have a vested interest in appearing to be learning, it may be difficult to tell. The form of learning tasks is common, but the substance is not necessarily present.

The Task of Teaching in Classrooms

The analysis to this point has raised an interesting puzzle, namely, How it is possible that students can have this degree of influence over learning tasks in classrooms? This concluding section contains a brief consideration of this question (for greater detail, see Doyle, 1979).

Cooperation in Activities

Theoretically any learning task can occur in a classroom if it is assumed that teachers are immune to situational influences. Barring this mythical possibility, it is necessary to examine the instructions for behavior given to teachers by the classroom environment if we are to understand student influence on teachers.

On a daily basis, teachers encounter classrooms as units of time and as groups of students. These situational factors define the teacher's proximate task as one of (a) planning classroom activities to fill time and (b) gaining and maintaining the cooperation of students in these activities. In addition to the

requirements that activities fill time and that cooperation be maintained, the activities used must have academic "face validity." That is, what students and teachers do in classrooms must appear to have some connection with generally-valued outcomes of schooling. Given variations in student abilities and inclinations to cooperate in activities, the complexity of the classroom environment, and the frequency and duration of class meetings, accomplishing the teacher's task in classrooms can be difficult.

Before going on, it is necessary to define the concept of "activity" as a frame within which classroom events take place. The term "activity" is derived largely from the work in ecological psychology (see Gump, 1969; Kounin & Gump, 1974; Yinger, in press) and refers to a bounded segment of classroom time distinguished by an identifiable pattern for the social organization of work. Common labels for activities usually refer to either the mode of organization (e.g., seatwork, small-group discussion, teacher lecture) or the concern or focal content of the segment (e.g., art, math, vocabulary). Other key dimensions of activities include duration, the physical space in which an activity occurs, the type and number of participants, the props or resources used, and the expected and actual behaviors of participants. As an analytical unit, then, an activity represents a fairly large chunk of classroom time. At the secondary level, a single activity may fill an entire class period. More commonly, activities

change in some key dimensions every ten to fifteen minutes in many elementary and secondary classrooms.

Cooperation in an activity depends upon a number of factors, including (a) the structure of the activity, i.e., the spatial configuration and interdependencies among participants (Kounin & Gump, 1974); (b) the familiarity of the activity to the participants (Yinger, in press); (c) the rule system and management skills of the teacher (Doyle, 1979; Kounin, 1970); and (d) the students' abilities and inclinations to participate (Campbell, 1974; Metz, 1978). The study of activities is especially relevant to an understanding of the way in which teachers manage classroom groups (Evertson & Anderson, Note 8).

It is not possible to discuss here the many facets of classroom activities and their management. The discussion will focus, therefore, on the factors which shape teacher behavior in classrooms and then concentrate on how the teacher's task of maintaining cooperation in activities affects the students' task of maintaining favorable performance-grade exchanges.

Teacher Behavior in Classrooms

An analysis of interactive decision making in classrooms leads to the conclusion that teachers reduce information-processing load by routinizing many operations, including many aspects of their own behavior such as asking questions, praising answers, or monitoring student behavior (Doyle, 1979; Yinger, in press). This reliance on automaticity enables teachers to concentrate

focal attention on events that signal a potential breakdown in an activity. Teachers can, for example, keep an activity moving while watching students who are likely to originate misbehavior that spreads easily to other students in the room. This analysis suggests that teacher behavior is shaped by demands of activity management rather than information about the learning states of individual pupils. The behaviors teachers use when interacting with students, behaviors such as type of question, quality of praise, and even the content of the statement, are likely to be a function of the individual student's pattern of cooperation in the activity. If this is the case, then it is probable that correlations between specific teacher behaviors and learning outcomes are spurious. Further, information about learning tasks will not necessarily increase our confidence in the correlations if the behavior itself is directed to cooperation rather than learning.

The Relationship Between Teacher and Student Tasks

Teacher and student tasks intersect in several ways in classrooms. Activities shape the conditions in which tasks are communicated to and accomplished by students. The probability of task accomplishment for students is influenced in part by the resources (such as teacher prompts, materials, and peer help) available in the setting, and the consequences of accomplishing tasks is determined by the operations (such as copying, recall, understanding, or problem solving) students are allowed to use when working on tasks. At the same time, the student

tasks a teacher attempts to implement influence the likelihood of student cooperation and thus the likelihood of teacher task accomplishment.

An extension of this analysis will clarify these interrelationships. Every activity contains a definition of roles for participants, such as listening, writing, answering, questioning, etc. For an activity to "work," at least some students must be willing to participate, i.e., become involved in the activity, and most students must be willing to cooperate, i.e., allow the activity to continue without disruption. If a large number of students do not cooperate in the activity, then public evidence is available to all students present that the teacher lacks classroom management skills, a condition that has serious consequences for cooperation in the future. Achieving cooperation, in other words, is a student expectation for teachers (Nash, 1976), and if cooperation is not achieved, misbehavior increases and cooperation can be lost completely. There is evidence that during the early class meetings students push the limits of teacher management skills to verify that teachers can manage classroom activities (Doyle, 1979; Gannaway, 1976; Anderson & Evertson, Note 9). Cooperation is not automatic but must be earned by demonstrating tactical skills in managing classroom demands.

One way to reduce the demands of achieving cooperation is to adjust both task demands and activities to accommodate the ability level and inclination to cooperate that characterize a particular classroom group. There is some descriptive evidence

that teachers do make such adjustments so that more students can and will participate in activities and complete assignments. Three examples will illustrate this process. First, studies of class discussions at both primary and secondary levels (Bellack, Kliebard, Hyman, & Smith, 1966; Mehan, 1974; Rowe, 1974, MacLure & French, Note 10) have found that teachers sometimes praise "wrong" answers. A careful reading of the transcripts of such lessons (especially MacLure & French, Note 10) suggests, however, that the students' role in these activities is to answer rather than give correct answers. By adjusting the "correctness" criterion for answers, the teacher is able to elicit participation in the activity from a larger number of students. Of course, this adjustment produces a "no task" situation for students so that one would not expect meaningful academic treatment effects for this activity.

The second example comes from a descriptive study by MacKay (1978) published recently in Sociology of Education. MacKay described classroom activities in which there appears to be conflict between the manifest goal of learning and the actual behavior of the teacher and students. In some instances, the teacher actually completed the apparent learning task for the student. One student is quoted as saying: "Yeah, I hardly do nothing. All you gotta do is act dumb and Mr. Y will tell you the right answer. You just gotta wait, you know, and he'll tell you" (p. 184). From an activity perspective, however, this teacher action enables more students to "participate."

Again, by adjusting learning task criteria, a teacher in all likelihood increases cooperation but changes what is learned.

The final examples come from some unpublished observations recently conducted by Stovall (personal communication, 1979). The value of Stovall's observations is that they contain task and activity data about the same teacher teaching the same content to two classes that differed in academic aptitude and inclination to cooperate. In teaching a grammar lesson on verbals to the high ability class, the teacher described and gave examples of participles, gerunds, and infinitives and then asked the class to complete three original sentences for each form. The assignment was to be completed in class and would be graded. In the lower ability class, the teacher presented the same information and supplied extra examples. Students were then asked to copy sentences from the board and underline the verbals, an assignment which was also to be turned in at the end of the period and graded. Differences were also apparent in how the teacher tested students on the background information presented in class about a play they were studying. In the high ability class, students were required to answer essay questions without using their notes. In the lower ability class, the students were asked to hand in summaries of the information contained in their notes.

Stovall's examples illustrate clearly the adjustment of learning task demands and activities to secure cooperation. They also suggest that qualitatively different outcomes are likely to be produced by such adjustments.

These examples suggest that teachers do adjust classroom demands and processes, that these adjustments change the qualitative nature of student learning tasks in ways that often reduce risk and ambiguity in achieving favorable performance-grade exchanges, and that cooperation is the mechanism that activates these adjustments. This combination of factors explains in part at least why and how students can influence learning task demands in classrooms.

The argument is not that learning tasks cannot be sustained in classrooms. The evidence is clear, however, that sustaining learning tasks, especially those which involve understanding and problem solving by students, is likely to be quite difficult without elaborate and often expensive mechanisms to maintain accountability and control (see Davis, Jockusch, & McKnight, 1978).

Conclusion

Three major conclusions seem to follow from this analysis of what we see when we look in classrooms.

1. There would appear to be no direct teacher effects in the sense that these effects have traditionally been conceptualized as relationships between specific teacher behaviors and measures of achievement. Teacher behavior in classrooms in most likely a <u>product</u> of teacher-student interaction and is shaped by the demands of securing cooperation in classroom activities.

2. Learning tasks shape achievement in classrooms directly, and, if a learning task occurs, there are always effects. The appropriate questions for research are not whether there are classroom effects but whether learning tasks are operative and what the effects of these learning tasks are.
3. Because of the configuration of actual tasks for teachers and students in classrooms, learning tasks do not always take place, and sustaining learning tasks requires a large amount of skill and effort, the nature of which we have only begun to understand.

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